



UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE

United States Patent and Trademark Office

Address: COMMISSIONER FOR PATENTS

P.O. Box 1450

Alexandria, Virginia 22313-1450

www.uspto.gov

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/587,266	07/26/2006	Tadahiro Ohmi	427-109	4778
23117 7590 04/01/2009 NIXON & VANDERHYE, PC 901 NORTH GLEBE ROAD, 11TH FLOOR ARLINGTON, VA 22203				
EXAMINER				
NGUYEN, COLETTE B				
ART UNIT		PAPER NUMBER		
1793				
MAIL DATE		DELIVERY MODE		
04/01/2009		PAPER		

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary

Application No.

10/587,266

Applicant(s)

OHMI ET AL.

Examiner

COLETTE NGUYEN

Art Unit

1793

Period for Reply -- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 02 December 2008.
- 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1,2 and 4-12 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1,2 and 4-12 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
 2. ☐ Certified copies of the priority documents have been received in Application No. _____.
 3. ☒ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftperson's Patent Drawing Review (PTO-948)
- 3) ☒ Information Disclosure Statement(s) (PTO-850)
- 4) ☐ Interview Summary (PTO-413)
- 5) ☐ Notice of Informal Patent Application
- 6) ☐ Other: _____
- Paper No(s)/Mail Date 02/04/08, 07/26/06, 08/19/08

DETAILED ACTION

Status of the application

Claim 3 canceled. Claim 12 new. Claims 1 and 8 amended. Claims 1-2 and 4-12 are presented here for examination

Claim Rejections - 35 USC § 103

1. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

2. **Claims 1-2 and 4-12** are rejected under 35 U.S.C. 103(a) as being unpatentable over Rostaing et al. (5,993,612) in view of Breitbarth et al. (DE4319118).

Regarding claim 1: Rostaing discloses a process and apparatus for purifying a gas, in particular a plasmagenic rare gas, such as krypton and xenon containing tetrafluoro methane (CF₄), a halide gas. Rostaing teaches that as the gas exits the production equipment, it flows through a high frequency field applicator device (col 4, ln 54) for the purpose of excite the gas before reaching the hollow dielectric tube (an excitation unit) , creating an electric field in the gas by means of a traveling electromagnetic wave (surfatron guide type) which creates a low pressure plasma for the purpose of

dissociating the impurities in the gas in order to form reactive compounds, then making the reactive compounds formed react with a corresponding reactive element (a reaction remover) for the purpose of eliminating them from the gas to be purified. He is silent about using calcium compound (Col2, In1-45). Breitbarth teaches process and apparatus for disposing of fluorocarbon containing compounds by conversion of these compounds in a plasma-chemical process in which the said compound are converted in the plasma with a solid with addition of oxygen, steam or hydrogen. The solid can be SiO_2 which may also be reacted as a wall of the reaction chamber. An additional coating with catalytically active substances and with alkali metal compound or alkaline earth metal (calcium is an alkaline) compound enables an acceleration of reaction and formation of fluorides acceptable for landfill. The apparatus used is plasma reactor which contains the solid and can be operated with a high frequency, low frequency, direct current or microwave discharge".) (Abstract) Both do not specify that the flow is viscous, however as steam is introduced as taught by Breitbarth and Rostaing points out that *"to increase the efficiency of the removal of the impurities, it is necessary that the flowing gas is put in contact with water so that this gas becomes laden with vapour"*, which obviously makes the gas saturated and viscous. (Col 11, In 25). As both teach gas purification using plasma, It would have been obvious for one of ordinary skill in the art at the time of the invention to combine the teachings of Breitbarth of using calcium compound (an alkaline) with the teachings of Rostaing to improve the process of purifying perfluorinated gases and to achieve savings by minimizing equipment such as piping and by speeding up the process.

3. Regarding claims 2 and 9. Rostaing in view of Breithbarth specify an exhaust gas treatment method according to claims 1 and 8, wherein the exhaust gas is reacted with a reaction remover in the presence of oxygen. Rostaing (Col2, In 32, "Oxygen is added to the gas, prior to the step of making the gas flow through the dielectric tube"). It would have been obvious for one of ordinary skill in the art at the time of the invention to claim the addition of oxygen in the excitation unit (the dielectric tube) to make the unit compact and also where the oxygen is added is not important as long as it is added before introducing to the excitation unit .
4. Regarding claims 4 and 10. Rostaing in view of Breitbarth disclose an exhaust gas treatment method according to claim 1 and 8 wherein at least a portion of the exhaust gas is put into the excited state by plasma and /or ultraviolet light. (Breitbarth, pg 1, para 6, "...With the help of a plasma-chemical process in interaction with a solid volatile and hydrolysable products..." and "the apparatus used is plasma reactor which contains the solid and can be operated with a high frequency, low frequency, direct current or microwave discharge").Ultraviolet radiation device is a low frequency. Rostaing (col2, In15," crating an electric field in the gas, an atmospheric-pressure plasma...").
5. Regarding claim 5. Rostaing discloses the exhaust gas contains xenon and/or krypton.(Col3, In 64)
6. Regarding claims 6 and 11. Rostaing in view of Breitbarth disclose an exhaust gas treatment method according to claim 1 and 8 wherein calcium oxide and/or calcium hydroxide as reaction remover. (Breitbarth, pg 1, para. 10, "By introduction of

alkali and/or alkaline –earth hydroxide or also oxides"). A well known reagent for decomposing fluorocarbons in the art that one of ordinary skill use for gas treatment.

7. Regarding claim 7. Rostaing in view of Breitbarth disclose an exhaust gas treatment method according to claim 1 wherein the harmful gas component is a hydride or halide of an element oxide of which is a solid.(Breitbarth, pg.1, para.1 "The inversion relates to a method to the disposal of fluorine-carbonaceous and other fluorohalide compounds, with which the fluorine compound is a solid") and Rostaing (col4, ln32-40)

8. Regarding claim 8. Rostaing discloses a process and apparatus for purifying a gas, in particular a plasmagenic rare gas, such as krypton and xenon containing tetrafluoro methane (CF₄), a halide gas (Figs 1-6). The method involves exciting the gas to be purified before reaching the hollow dielectric tube (an excitation unit) for the purpose of dissociating the impurities in the gas in order to form reactive compounds, then making the reactive compounds formed react with a corresponding reactive element (a reaction remover) for the purpose of eliminating them from the gas to be purified. Breitbarth teaches process and apparatus for disposing of fluorocarbon containing compounds by conversion of these compounds in a plasma-chemical process in which the said compound are converted in the plasma with a solid with addition of oxygen, steam or hydrogen. The apparatus used is plasma reactor which contains the solid and can be operated with a high frequency, low frequency, direct current or microwave discharge".) with vacuum pumps. (Breitbarth, pag 2, para 9,10 of the translation," an apparatus is convenient, which becomes operated between two

vacuum pumps. Via the pressure differential and the suction power of the pumps the conversion and the optimum reaction conditions can be steered"). Both do not specify that the flow is viscous, however as steam is introduced as taught by Breitbarth and Rostaing points out that *"to increase the efficiency of the removal of the impurities, it is necessary that the flowing gas is put in contact with water so that this gas becomes laden with vapour"*, which makes the flow viscous. (Col 11, ln 25). As both teach gas purification using plasma, It would have been obvious for one of ordinary skill in the art at the time of the invention to combine the teaching of Breitbarth of using vacuum pumps with teaching of Rostaing to improve the process of purifying perfluorinated gases by modifying the equipments to suit the needs and to achieve savings by minimizing equipment.

1. Regarding claim 12. Rostaing in view of Breitbarth disclose an exhaust gas treatment method according to claim 1. They do not specify SV and LV value of the reactor. However, Breitbarth discloses that "depend on the gas throughout and the pressure as well as the electrical power current fed, SV and LV value will be optimized for equipment sizing". (page 2, para 13 of the translation). As Sv and LV values are optimizing result-effective variables, they have no patentability weight. See MPEP 2144.05.

Response to Arguments

Applicant's arguments with respect to claims 1-11 filed on 12/2/2008 have been considered but are moot in view of the new ground(s) of rejection.

Conclusion

2. The prior art made of record and not relied upon are considered pertinent to applicant's disclosure. US6,022,489, US5,750,823, US5,907,077, US6,294,709.
3. Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire **THREE MONTHS** from the mailing date of this action. In the event a first reply is filed within **TWO MONTHS** of the mailing date of this final action and the advisory action is not mailed until after the end of the **THREE-MONTH** shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than **SIX MONTHS** from the date of this final action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to **COLETTE NGUYEN** whose telephone number is

(571)270-5831. The examiner can normally be reached on Monday-Thursday, 10:00-4:00 PM.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Curt Mayes can be reached on (571)-272-1234. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/COLETTE NGUYEN/
Examiner, Art Unit 1793

CN
March 20, 2009

/Melvin Curtis Mayes/
Supervisory Patent Examiner, Art Unit 1793